

# **SEMICONDUCTOR DEVICE HAVING IMPROVED SHORT CHANNEL EFFECTS, AND METHOD OF FORMING THEREOF**

## **ABSTRACT OF THE DISCLOSURE**

Semiconductor device having improved short channel effects and method of forming thereof. One method includes forming a gate oxide over a substrate and a gate electrode over the gate oxide, and implanting impurities into the substrate using the gate electrode as an implant mask to form a lightly-doped region in the substrate. The method includes depositing second spacer material adjacent to the gate electrode, forming a first spacer on the second spacer material, and implanting impurities into the substrate and through a portion of the lightly-doped region using the first spacer as an implant mask to form a first junction region in the substrate. The method includes removing the first spacer, etching the second spacer material to form a second spacer adjacent the gate electrode, and implanting impurities into the substrate using the second spacer as an implant mask to form a second junction region in the substrate.